SEQUENCE LISTING

<110> ISHIKAWA, KOHKI
SUZUKI, EI-ICHIRO
GONDOH, KEIKO
SHIMBA, NOBUHISA
MIHARA, YASUHIRO
KAWASAKI, HISASHI
KURAHASHI, OSAMU
KOUDA, TOHRU
SHIMAOKA, MEGUMI
KOZUTSUMI, RIE
ASANO, YASUHISA

<120> MUTANT NUCLEOSIDE-5'-PHOSPHATE PRODUCING ENZYMES

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<140> 09/807,990
<141> 2000-09-01

<150> JP 11/249545
<151> 1999-09-03

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cgcgggggtt ccccgggccg ctttttttta tggggctgcg gtgaggagcg ttatctgctg 180

gccctgtttg tgcaacaaac gcttttattg tgtaattttt gtgacgtata tcaggttttt 240

aagcaccctg tggcgctcat actggcaacc tgttgatatt aagcaacact cttcactcac 300

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Cys Phe Ala Ala Leu Phe Ser Ser Gln Ala Leu Ala Leu Val Ala Thr
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ggc aac gac act acc acg aaa ccg gat ctc tac tac ctc aag aac agt 450
Gly Asn Asp Thr Thr Thr Lys Pro Asp Leu Tyr Tyr Leu Lys Asn Ser
25 30 35 40

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Glu Ala Ile Asn Ser Leu Ala Leu Leu Pro Pro Pro Pro Ala Val Gly
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tcc att gcg ttt ctc aac gat cag gcc atg tat gaa cag ggg cgc ctg 546
Ser Ile Ala Phe Leu Asn Asp Gln Ala Met Tyr Glu Gln Gly Arg Leu
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Leu Arg Asn Thr Glu Arg Gly Lys Leu Ala Ala Glu Asp Ala Asn Leu
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Ser Ser Gly Gly Val Ala Asn Ala Phe Ser Gly Ala Phe Gly Ser Pro
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atc acc gaa aaa gac gcc ccg gcg ctg cat aaa tta ctg acc aat atg 690
Ile Thr Glu Lys Asp Ala Pro Ala Leu His Lys Leu Leu Thr Asn Met
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Ile Glu Asp Ala Gly Asp Leu Ala Thr Arg Ser Ala Lys Asp His Tyr
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140 145 150

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155 160 165

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Thr Ser Ile Gly Trp Ala Thr Ala Leu Val Leu Ala Glu Ile Asn Pro
170 175 180

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Arg Val Ile Cys Gly Tyr His Trp Gln Ser Asp Val Asp Ala Ala Arg
205 210 215

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Val Val Gly Ser Ala Val Val Ala Thr Leu His Thr Asn Pro Ala Phe
220 225 230

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Gln Gln Gln Leu Gln Lys Ala Lys Ala Glu Phe Ala Gln His Gln Lys
235 240 245

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Lys

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35 40 45

Leu Pro Pro Pro Pro Ala Val Gly Ser Ile Ala Phe Leu Asn Asp Gln
50 55 60

Ala Met Tyr Glu Gln Gly Arg Leu Leu Arg Asn Thr Glu Arg Gly Lys
65 70 75 80

Leu Ala Ala Glu Asp Ala Asn Leu Ser Ser Gly Gly Val Ala Asn Ala
85 90 95

Phe Ser Gly Ala Phe Gly Ser Pro Ile Thr Glu Lys Asp Ala Pro Ala
100 105 110

Leu His Lys Leu Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala
115 120 125

Thr Arg Ser Ala Lys Asp His Tyr Met Arg Ile Arg Pro Phe Ala Phe
130 135 140

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Asn Gly Ser Tyr Pro Ser Gly His Thr Ser Ile Gly Trp Ala Thr Ala
165 170 175

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180 185 190

Arg Gly Tyr Glu Leu Gly Gln Ser Arg Val Ile Cys Gly Tyr His Trp
195 200 205

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catcaaaaat acttacctgt cttccgtctg tttcgtcaca ctttttttgaa agagttaaca 240

tcaatttgca tctctccgcc ctacactggc agacaggttt ctgagtaata ctgttgtatc 300

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Met Lys Lys Asn Ile Ile Ala Gly Cys Leu Phe Ser
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ctg ttt tcc ctt tcc gcg ctg gcc gcg atc ccg gcg ggc aac gat gcc 399
Leu Phe Ser Leu Ser Ala Leu Ala Ala Ile Pro Ala Gly Asn Asp Ala
15 20 25

acc acc aag ccg gat tta tat tat ctg aaa aat gaa cag gct atc gac 447
Thr Thr Lys Pro Asp Leu Tyr Tyr Leu Lys Asn Glu Gln Ala Ile Asp
30 35 40

agc ctg aaa ctg tta ccg cca ccg ccg gaa gtc ggc agt att cag ttt 495
Ser Leu Lys Leu Leu Pro Pro Pro Pro Glu Val Gly Ser Ile Gln Phe
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tta aat gat cag gca atg tat gag aaa ggc cgt atg ctg cgc aat acc 543
Leu Asn Asp Gln Ala Met Tyr Glu Lys Gly Arg Met Leu Arg Asn Thr
65 70 75

gag cgc gga aaa cag gca cag gca gat gct gac ctg gcc gca ggg ggt 591
Glu Arg Gly Lys Gln Ala Gln Ala Asp Ala Asp Leu Ala Ala Gly Gly
80 85 90

gtg gca acc gca ttt tca ggg gca ttc ggc tat ccg ata acc gaa aaa 639
Val Ala Thr Ala Phe Ser Gly Ala Phe Gly Tyr Pro Ile Thr Glu Lys
95 100 105

gac tct ccg gag ctg tat aaa ctg ctg acc aat atg att gag gat gcc 687
Asp Ser Pro Glu Leu Tyr Lys Leu Leu Thr Asn Met Ile Glu Asp Ala
110 115 120

ggt gat ctt gcc acc cgc tcc gcc aaa gaa cat tac atg cgc atc cgg 735
Gly Asp Leu Ala Thr Arg Ser Ala Lys Glu His Tyr Met Arg Ile Arg
125 130 135 140

ccg ttt gcg ttt tac ggc aca gaa acc tgt aat acc aaa gat cag aaa 783
Pro Phe Ala Phe Tyr Gly Thr Glu Thr Cys Asn Thr Lys Asp Gln Lys
145 150 155

aaa ctc tcc acc aac gga tct tac ccg tca ggt cat acg tct atc ggc 831

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Lys Leu Ser Thr Asn Gly Ser Tyr Pro Ser Gly His Thr Ser Ile Gly
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tgg gca acc gca ctg gtg ctg gcg gaa gtg aac ccg gca aat cag gat      879
Trp Ala Thr Ala Leu Val Leu Ala Glu Val Asn Pro Ala Asn Gln Asp
        175                 180                 185

gcg att ctg gaa cgg ggt tat cag ctc gga cag agc cgg gtg att tgc      927
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ggc tat cac tgg cag agt gat gtg gat gcc gcg cgg att gtc ggt tca      975
Gly Tyr His Trp Gln Ser Asp Val Asp Ala Ala Arg Ile Val Gly Ser
205                 210                 215                 220

gcc gct gtc gcg aca tta cat tcc gat ccg gca ttt cag gcg cag tta     1023
Ala Ala Val Ala Thr Leu His Ser Asp Pro Ala Phe Gln Ala Gln Leu
                225                 230                 235

gcg aaa gcc aaa cag gaa ttt gca caa aaa tca cag aaa taaaagcagt      1072
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          240                 245

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Asp Leu Tyr Tyr Leu Lys Asn Glu Gln Ala Ile Asp Ser Leu Lys Leu
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Gln Ala Gln Ala Asp Ala Asp Leu Ala Ala Gly Gly Val Ala Thr Ala
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Phe Ser Gly Ala Phe Gly Tyr Pro Ile Thr Glu Lys Asp Ser Pro Glu
100 105 110

Leu Tyr Lys Leu Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala
115 120 125

Thr Arg Ser Ala Lys Glu His Tyr Met Arg Ile Arg Pro Phe Ala Phe
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Tyr Gly Thr Glu Thr Cys Asn Thr Lys Asp Gln Lys Lys Leu Ser Thr
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Asn Gly Ser Tyr Pro Ser Gly His Thr Ser Ile Gly Trp Ala Thr Ala
165 170 175

Leu Val Leu Ala Glu Val Asn Pro Ala Asn Gln Asp Ala Ile Leu Glu
180 185 190

Arg Gly Tyr Gln Leu Gly Gln Ser Arg Val Ile Cys Gly Tyr His Trp
195 200 205

Gln Ser Asp Val Asp Ala Ala Arg Ile Val Gly Ser Ala Ala Val Ala
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225 230 235 240

Gln Glu Phe Ala Gln Lys Ser Gln Lys

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Met Lys Ser Arg Tyr Leu Val Phe Phe Leu Pro Leu Ile
1 5 10

gta gct aaa tat aca tca gca gaa aca gtg caa ccc ttt cat tct cct 218
Val Ala Lys Tyr Thr Ser Ala Glu Thr Val Gln Pro Phe His Ser Pro
15 20 25

gaa gaa tca gtg aac agt cag ttc tac tta cca cca ccg cca ggt aat 266
Glu Glu Ser Val Asn Ser Gln Phe Tyr Leu Pro Pro Pro Pro Gly Asn
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gat gat ccg gct tac cgc tat gat aag gag gct tat ttt aag ggc tat 314
Asp Asp Pro Ala Tyr Arg Tyr Asp Lys Glu Ala Tyr Phe Lys Gly Tyr
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gcg ata aag ggt tcc ccg cga tgg aaa caa gct gct gag gat gca gat 362
Ala Ile Lys Gly Ser Pro Arg Trp Lys Gln Ala Ala Glu Asp Ala Asp
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Val Ser Val Glu Asn Ile Ala Arg Ile Phe Ser Pro Val Val Gly Ala
80 85 90

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Lys Ile Asn Pro Lys Asp Thr Pro Glu Thr Trp Asn Met Leu Lys Asn
95 100 105

ctt ctg aca atg ggc ggc tac tac gct act gct tcg gca aaa aaa tat 506
Leu Leu Thr Met Gly Gly Tyr Tyr Ala Thr Ala Ser Ala Lys Lys Tyr
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Tyr Met Arg Thr Arg Pro Phe Val Leu Phe Asn His Ser Thr Cys Arg
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cct gaa gat gag aat act ttg cga aaa aat ggc tct tac cct tcc ggg      602
Pro Glu Asp Glu Asn Thr Leu Arg Lys Asn Gly Ser Tyr Pro Ser Gly
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cat act gct tat ggt aca ctt ctg gca tta gta tta tcc gag gcc aga      650
His Thr Ala Tyr Gly Thr Leu Leu Ala Leu Val Leu Ser Glu Ala Arg
        160                 165                 170

ccg gaa cgc gcg cag gag ctc gcc aga cgc gga tgg gag ttc ggg caa      698
Pro Glu Arg Ala Gln Glu Leu Ala Arg Arg Gly Trp Glu Phe Gly Gln
    175                 180                 185

agc aga gtg ata tgc ggt gct cac tgg caa agc gat gtt gat gct ggc      746
Ser Arg Val Ile Cys Gly Ala His Trp Gln Ser Asp Val Asp Ala Gly
190                 195                 200                 205

cgt tat gtg gga gca gta gag ttt gca aga ctg caa aca atc ccg gct      794
Arg Tyr Val Gly Ala Val Glu Phe Ala Arg Leu Gln Thr Ile Pro Ala
                210                 215                 220

ttt cag aag tca ctg gca aaa tcc gtg agg agc tgaacgacaa aaataattta    847
Phe Gln Lys Ser Leu Ala Lys Ser Val Arg Ser
            225                 230

ttgagtaaag aagatcaccc caaacttaat tactgaaggt gaaagtcttc ccgcaaactg    907

gccacagcaa atgaaaggaa gtgcaactgc gtaggggcgg ccgggcgtgg agaatgcctt    967

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Val Asn Ser Gln Phe Tyr Leu Pro Pro Pro Pro Gly Asn Asp Asp Pro
        35                  40                  45
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Gly Ser Pro Arg Trp Lys Gln Ala Ala Glu Asp Ala Asp Val Ser Val
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Glu Asn Ile Ala Arg Ile Phe Ser Pro Val Val Gly Ala Lys Ile Asn
85 90 95

Pro Lys Asp Thr Pro Glu Thr Trp Asn Met Leu Lys Asn Leu Leu Thr
100 105 110

Met Gly Gly Tyr Tyr Ala Thr Ala Ser Ala Lys Lys Tyr Tyr Met Arg
115 120 125

Thr Arg Pro Phe Val Leu Phe Asn His Ser Thr Cys Arg Pro Glu Asp
130 135 140

Glu Asn Thr Leu Arg Lys Asn Gly Ser Tyr Pro Ser Gly His Thr Ala
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Tyr Gly Thr Leu Leu Ala Leu Val Leu Ser Glu Ala Arg Pro Glu Arg
165 170 175

Ala Gln Glu Leu Ala Arg Arg Gly Trp Glu Phe Gly Gln Ser Arg Val
180 185 190

Ile Cys Gly Ala His Trp Gln Ser Asp Val Asp Ala Gly Arg Tyr Val
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Gly Ala Val Glu Phe Ala Arg Leu Gln Thr Ile Pro Ala Phe Gln Lys
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Ser Leu Ala Lys Ser Val Arg Ser
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agctatggct tccacacgat agacccgcgc aacacataat tgtcttatta tagccacatg 180

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Leu Thr Ser Gly Val Leu Ala Ser Gly Leu Ser Gln Ser Val Ser Ala
15 20 25

cat aca gaa aaa agt gaa ccc tcc tcg act tat cat ttc cac agc gat 448
His Thr Glu Lys Ser Glu Pro Ser Ser Thr Tyr His Phe His Ser Asp
30 35 40

ccc ctt ctt tac ctt gcg ccc cca ccc act tcc ggc agt cca tta cag 496
Pro Leu Leu Tyr Leu Ala Pro Pro Pro Thr Ser Gly Ser Pro Leu Gln
45 50 55 60

gcg cat gat gat caa acc ttt aac agc acc aga caa tta aaa ggt agc 544
Ala His Asp Asp Gln Thr Phe Asn Ser Thr Arg Gln Leu Lys Gly Ser
65 70 75

acg cgc tgg gca ttg gca act caa gat gcc gat ctt cat ctc gct tca 592
Thr Arg Trp Ala Leu Ala Thr Gln Asp Ala Asp Leu His Leu Ala Ser
80 85 90

gtt ctc aaa gac tat gcc tgc gcc gca gga atg aat ctc gat att gcg 640
Val Leu Lys Asp Tyr Ala Cys Ala Ala Gly Met Asn Leu Asp Ile Ala
95 100 105

caa tta ccg cat ctt gcc aat ttg att aaa cgc gca ctt cgc acc gaa 688
Gln Leu Pro His Leu Ala Asn Leu Ile Lys Arg Ala Leu Arg Thr Glu
110 115 120

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Tyr Asp Asp Ile Gly Arg Ala Lys Asn Asn Trp Asn Arg Lys Arg Pro
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ttt gtg gat acc gat caa ccc atc tgc acg gaa aaa gat cgc gaa ggt      784
Phe Val Asp Thr Asp Gln Pro Ile Cys Thr Glu Lys Asp Arg Glu Gly
                145                 150                 155

ctg gga aaa caa ggc tcc tat cct tca ggt cat acg act atc ggt tgg      832
Leu Gly Lys Gln Gly Ser Tyr Pro Ser Gly His Thr Thr Ile Gly Trp
            160                 165                 170

agc gtt gcg ctc att ctg gct gaa ttg atc ccc gat cat gcg gcg aat      880
Ser Val Ala Leu Ile Leu Ala Glu Leu Ile Pro Asp His Ala Ala Asn
        175                 180                 185

att ttg cag cgt ggc caa att ttt gga acc agc cgg att gtc tgc ggc      928
Ile Leu Gln Arg Gly Gln Ile Phe Gly Thr Ser Arg Ile Val Cys Gly
    190                 195                 200

gcc cat tgg ttc agc gat gtg cag gca ggc tat atc atg gca tcg ggc      976
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205                 210                 215                 220

gaa att gca gct tta cat ggg gat gcc gat ttc cgc cga gat atg gaa     1024
Glu Ile Ala Ala Leu His Gly Asp Ala Asp Phe Arg Arg Asp Met Glu
                225                 230                 235

tta gct cgg aaa gaa tta gaa aag gca cgc aca tca gcg cac acg cca     1072
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            240                 245                 250

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Asp Asp Leu Leu Cys Lys Ile Glu Gln Ser Ala Arg
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35 40 45

Leu Ala Pro Pro Pro Thr Ser Gly Ser Pro Leu Gln Ala His Asp Asp
50 55 60

Gln Thr Phe Asn Ser Thr Arg Gln Leu Lys Gly Ser Thr Arg Trp Ala
65 70 75 80

Leu Ala Thr Gln Asp Ala Asp Leu His Leu Ala Ser Val Leu Lys Asp
85 90 95

Tyr Ala Cys Ala Ala Gly Met Asn Leu Asp Ile Ala Gln Leu Pro His
100 105 110

Leu Ala Asn Leu Ile Lys Arg Ala Leu Arg Thr Glu Tyr Asp Asp Ile
115 120 125

Gly Arg Ala Lys Asn Asn Trp Asn Arg Lys Arg Pro Phe Val Asp Thr
130 135 140

Asp Gln Pro Ile Cys Thr Glu Lys Asp Arg Glu Gly Leu Gly Lys Gln
145 150 155 160

Gly Ser Tyr Pro Ser Gly His Thr Thr Ile Gly Trp Ser Val Ala Leu
165 170 175

Ile Leu Ala Glu Leu Ile Pro Asp His Ala Ala Asn Ile Leu Gln Arg
180 185 190

Gly Gln Ile Phe Gly Thr Ser Arg Ile Val Cys Gly Ala His Trp Phe

195 200 205

Ser Asp Val Gln Ala Gly Tyr Ile Met Ala Ser Gly Glu Ile Ala Ala
210 215 220

Leu His Gly Asp Ala Asp Phe Arg Arg Asp Met Glu Leu Ala Arg Lys
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Glu Leu Glu Lys Ala Arg Thr Ser Ala His Thr Pro Asp Asp Leu Leu
245 250 255

Cys Lys Ile Glu Gln Ser Ala Arg
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catctcctgt cattgcaatc ccgctatggt agcgcccaaa cggcaaggtg ataagtgcga 180

cagtccgaaa tcgcgagtgg ttgctcatta agcagacaaa tatgcgtttt tgcgataccg 240

aacaattttt tcaatgtgat tttaactttt acttacagat gacaaaaatg tgactaaaaa 300

caaaaccatt gttctggaca tataacaccg taaggaaatg tag atg aaa aag cgc 355
Met Lys Lys Arg
-20

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gtt ctc gcc ctc tgc ctc gcc agc ctg ttt tcc gtt aac gct ttc gcg      403
Val Leu Ala Leu Cys Leu Ala Ser Leu Phe Ser Val Asn Ala Phe Ala
    -15                 -10                 -5                  -1

ctg gtc cct gcc ggc aat gat gca acc acc aaa ccg gat ctc tat tat      451
Leu Val Pro Ala Gly Asn Asp Ala Thr Thr Lys Pro Asp Leu Tyr Tyr
1               5                   10                  15

ctg aaa aat gca cag gcc atc gat agt ctg gcg ctg ttg ccg ccg ccg      499
Leu Lys Asn Ala Gln Ala Ile Asp Ser Leu Ala Leu Leu Pro Pro Pro
            20                  25                  30

ccg gaa gtt ggc agc atc gca ttt tta aac gat cag gcg atg tat gag      547
Pro Glu Val Gly Ser Ile Ala Phe Leu Asn Asp Gln Ala Met Tyr Glu
        35                  40                  45

aaa gga cgg ctg ttg cgc aat acc gaa cgt ggc aag cag gcg cag gca      595
Lys Gly Arg Leu Leu Arg Asn Thr Glu Arg Gly Lys Gln Ala Gln Ala
    50                  55                  60

gat gct gac ctg gcc gcc ggc gac gtc gcg aat gcc ttc tcc agc gct      643
Asp Ala Asp Leu Ala Ala Gly Asp Val Ala Asn Ala Phe Ser Ser Ala
65                  70                  75                  80

ttt ggt tcg ccc atc acc gaa aaa gac gcg ccg cag tta cat aag ctg      691
Phe Gly Ser Pro Ile Thr Glu Lys Asp Ala Pro Gln Leu His Lys Leu
                85                  90                  95

ctg aca aat atg att gag gat gcc ggc gat ctg gcc acc cgc agc gcg      739
Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala Thr Arg Ser Ala
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aaa gag aaa tat atg cgc att cgc ccg ttt gcg ttc tac ggc gtt tca      787
Lys Glu Lys Tyr Met Arg Ile Arg Pro Phe Ala Phe Tyr Gly Val Ser
        115                 120                 125

acc tgt aac act aaa gac cag gac aag ctg tcg aaa aac gga tct tac      835
Thr Cys Asn Thr Lys Asp Gln Asp Lys Leu Ser Lys Asn Gly Ser Tyr
    130                 135                 140

cct tcc ggc cat acc tct acc ggt tgg gca acc gcg ctg gta ctg gcg      883
Pro Ser Gly His Thr Ser Thr Gly Trp Ala Thr Ala Leu Val Leu Ala
145                 150                 155                 160

gag atc aat ccg cag cgg caa aac gaa att ctc aaa cgc ggc tat gaa      931
Glu Ile Asn Pro Gln Arg Gln Asn Glu Ile Leu Lys Arg Gly Tyr Glu
                165                 170                 175

ttg ggc gaa agc cgg gtt atc tgc ggc tat cat tgg cag agc gat gtc      979
Leu Gly Glu Ser Arg Val Ile Cys Gly Tyr His Trp Gln Ser Asp Val
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gat gcg gcg cgg ata gtc ggc tcg gcg gtg gtg gcg acc ctg cat acc 1027
Asp Ala Ala Arg Ile Val Gly Ser Ala Val Val Ala Thr Leu His Thr
195 200 205

aac ccg gcc ttc caa cag cag ttg cag aaa gca aag gat gaa ttc gcc 1075
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Lys Thr Gln Lys
225

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15 20 25

Leu Pro Pro Pro Pro Glu Val Gly Ser Ile Ala Phe Leu Asn Asp Gln
30 35 40

Ala Met Tyr Glu Lys Gly Arg Leu Leu Arg Asn Thr Glu Arg Gly Lys
45 50 55 60

Gln Ala Gln Ala Asp Ala Asp Leu Ala Ala Gly Asp Val Ala Asn Ala
65 70 75

Phe Ser Ser Ala Phe Gly Ser Pro Ile Thr Glu Lys Asp Ala Pro Gln
80 85 90

Leu His Lys Leu Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala
95 100 105

Thr Arg Ser Ala Lys Glu Lys Tyr Met Arg Ile Arg Pro Phe Ala Phe
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Tyr Gly Val Ser Thr Cys Asn Thr Lys Asp Gln Asp Lys Leu Ser Lys
125 130 135 140

Asn Gly Ser Tyr Pro Ser Gly His Thr Ser Thr Gly Trp Ala Thr Ala
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Leu Val Leu Ala Glu Ile Asn Pro Gln Arg Gln Asn Glu Ile Leu Lys
160 165 170

Arg Gly Tyr Glu Leu Gly Glu Ser Arg Val Ile Cys Gly Tyr His Trp
175 180 185

Gln Ser Asp Val Asp Ala Ala Arg Ile Val Gly Ser Ala Val Val Ala
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<210> 120
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<220>
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<223> Xaa = any amino acid

<400> 121

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<400> 122

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Ser Arg Xaa Xaa Xaa Xaa Xaa His Xaa Xaa Xaa Asp
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<400> 124

Leu Ala Leu Val Ala Thr Gly Asn Asp Thr Thr Thr Lys Pro Asp Leu
1 5 10 15

Tyr Tyr Leu Lys Asn Ser Glu Ala Ile Asn Ser Leu Ala Leu Leu Pro

20 25 30

Pro Pro Pro Ala Val Gly Ser Ile Ala Phe Leu Asn Asp Gln Ala Met
35 40 45

Tyr Glu Gln Gly Arg Leu Leu Arg Asn Thr Glu Arg Gly Lys Leu Ala
50 55 60

Ala Glu Asp Ala Asn Leu Ser Ser Gly Gly Val Ala Asn Ala Phe Ser
65 70 75 80

Gly Ala Phe Gly Ser Pro Ile Thr Glu Lys Asp Ala Pro Ala Leu His
85 90 95

Lys Leu Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala Thr Arg
100 105 110

Ser Ala Lys Asp His Tyr Met Arg Ile Arg Pro Phe Ala Phe Tyr Gly
115 120 125

Val Ser Thr Cys Asn Thr Thr Glu Gln Asp Lys Leu Ser Lys Asn Gly
130 135 140

Ser Tyr Pro Ser Gly His Thr Ser Ile Gly Trp Ala Thr Ala Leu Val
145 150 155 160

Leu Ala Glu Ile Asn Pro Gln Arg Gln Asn Glu Ile Leu Lys Arg Gly
165 170 175

Tyr Glu Leu Gly Gln Ser Arg Val Ile Cys Gly Tyr His Trp Gln Ser
180 185 190

Asp Val Asp Ala Ala Arg Val Val Gly Ser Ala Val Val Ala Thr Leu
195 200 205

His Thr Asn Pro Ala Phe Gln Gln Gln Leu Gln Lys Ala Lys Ala Glu
210 215 220

Phe Ala Gln His Gln Lys Lys
225 230

<210> 125
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<212> PRT
<213> Enterobacter aerogenes

<400> 125

Leu Val Pro Ala Gly Asn Asp Ala Thr Thr Lys Pro Asp Leu Tyr Tyr
1 5 10 15

Leu Lys Asn Ala Gln Ala Ile Asp Ser Leu Ala Leu Leu Pro Pro Pro
20 25 30

Pro Glu Val Gly Ser Ile Ala Phe Leu Asn Asp Gln Ala Met Tyr Glu
35 40 45

Lys Gly Arg Leu Leu Arg Asn Thr Glu Arg Gly Lys Leu Ala Ala Glu
50 55 60

Asp Ala Asn Leu Ser Ala Gly Gly Val Ala Asn Ala Phe Ser Ser Ala
65 70 75 80

Phe Gly Ser Pro Ile Thr Glu Lys Asp Ala Pro Gln Leu His Lys Leu
85 90 95

Leu Thr Asn Met Ile Glu Asp Ala Gly Asp Leu Ala Thr Arg Ser Ala
100 105 110

Lys Glu Lys Tyr Met Arg Ile Arg Pro Phe Ala Phe Tyr Gly Val Ser
115 120 125

Thr Cys Asn Thr Thr Glu Gln Asp Lys Leu Ser Lys Asn Gly Ser Tyr
130 135 140

Pro Ser Gly His Thr Ser Ile Gly Trp Ala Thr Ala Leu Val Leu Ala
145 150 155 160

Glu Ile Asn Pro Gln Arg Gln Asn Glu Ile Leu Lys Arg Gly Tyr Glu
165 170 175

Leu Gly Glu Ser Arg Val Ile Cys Gly Tyr His Trp Gln Ser Asp Val
180 185 190

Asp Ala Ala Arg Ile Val Gly Ser Ala Val Val Ala Thr Leu His Thr
195 200 205

Asn Pro Ala Phe Gln Gln Gln Leu Gln Lys Ala Lys Asp Glu Phe Ala
210 215 220

Lys Thr Gln Lys
225